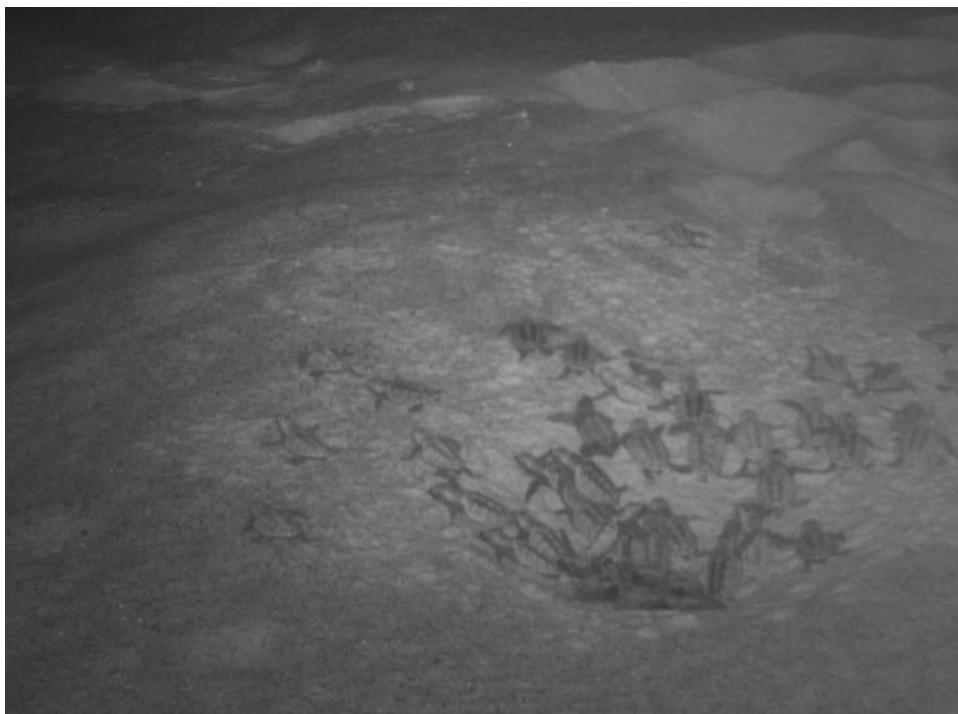


**Amrun Project - RTA Weipa Pty Ltd**

## Amrun Project (EPBC 2010/5642) – Annual Environmental Monitoring Report 2021

12 August 2021

A report prepared in accordance with EPBC Approval 2010/5642



Turtle hatchlings emerging on a local foreshore.

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# Amrun Project - Annual Environmental Monitoring Report 2021

## 1. Purpose

The Amrun Project (formerly South of Embley Project) involves the construction and operation of a bauxite mine and associated processing and port facilities to be located near Boyd Point on the western side of Cape York Peninsula. A detailed description of the Project is provided in the Queensland EIS (RTA 2011), the Queensland SEIS (RTA 2012), and the Commonwealth Environmental Impact Statement (RTA 2013). The marine works associated with the new port facility included the construction of jetty, wharf and ship loaders and dredging of berth pockets and departure channel.

Amrun Project Commonwealth approvals (EPBC/5642 Condition 57) requires environmental survey methodology and results associated with activities to be reported and published on the Rio Tinto Website. This annual report presents the monitoring and methodologies implemented between 12 May 2020 and 12 May 2021 associated with:

- Water quality monitoring associated with dredging activities
- Pre-disturbance reporting
- Weed management
- Fire management
- Feral animal monitoring and control
- Marine turtle monitoring
- Marine pests monitoring

In previous years these reports have been published individually but have been combined based on the interactive nature of the activities.

### 1.1 Project Overview

The Amrun (formerly Boyd components of the South of Embley) Project involves the construction and operation of a bauxite mine and associated processing and port facilities for shipping of bauxite to either Gladstone or international markets. The Amrun Project is located near Boyd Point on the western side of Cape York Peninsula approximately 40km south of Weipa (Figure 1).

The project is currently in the Operations phase with commencement of bauxite shipping on 02 December 2018<sup>1</sup>. The project has a current estimated production rate of approximately 22.8 million dry product tonnes per annum (Mdptpa). Actual production rates, timing and extent of future capacity expansions that are consistent with this approval will depend on market conditions. The anticipated mine life is approximately 40 years, depending on production rates.

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<sup>1</sup> Preliminary works commenced October 2015 and significant construction commenced in May 2016.

The main Amrun Project activities that have been completed to date are listed below. Detailed information on the full Project is presented in the South of Embley Project Commonwealth EIS (RTA 2013).

- Commencement of shipping and production
- Bauxite processing infrastructure –construction and operation of the Amrun (Boyd) beneficiation plant
- Product bauxite stockpiles –construction and operation of beneficiated product stockpiles adjacent to Amrun (Boyd) Port
- Ancillary infrastructure –construction of a diesel-fuelled power station, workshops, warehouse, administration facilities, package sewage treatment plant, temporary waste storage prior to disposal off-site and diesel storage facilities
- Barge, ferry and tug facilities – construction and operation of a new a roll on/roll off barge and ferry facility at Humbug Wharf, and a new barge and ferry terminal on the western bank of the Hey River
- On-site camp – the construction and operation of camp facility (also referred to as the Amrun Accommodation Village)
- Water infrastructure –construction and operation of a water supply dam on a freshwater tributary of Norman Creek (Arraw Dam (formerly Dam C), plus pipelines, water treatment plants (for potable water) and artesian bores
- Port and ship-loading facilities –construction and operation of the Port of Amrun, including shiploading and tug mooring facilities between Boyd Point and Pera Head. The Port of Weipa continues to receive deliveries of fuel, cargo, and equipment for the Amrun Project from domestic (mostly the Port of Cairns) and international ports.

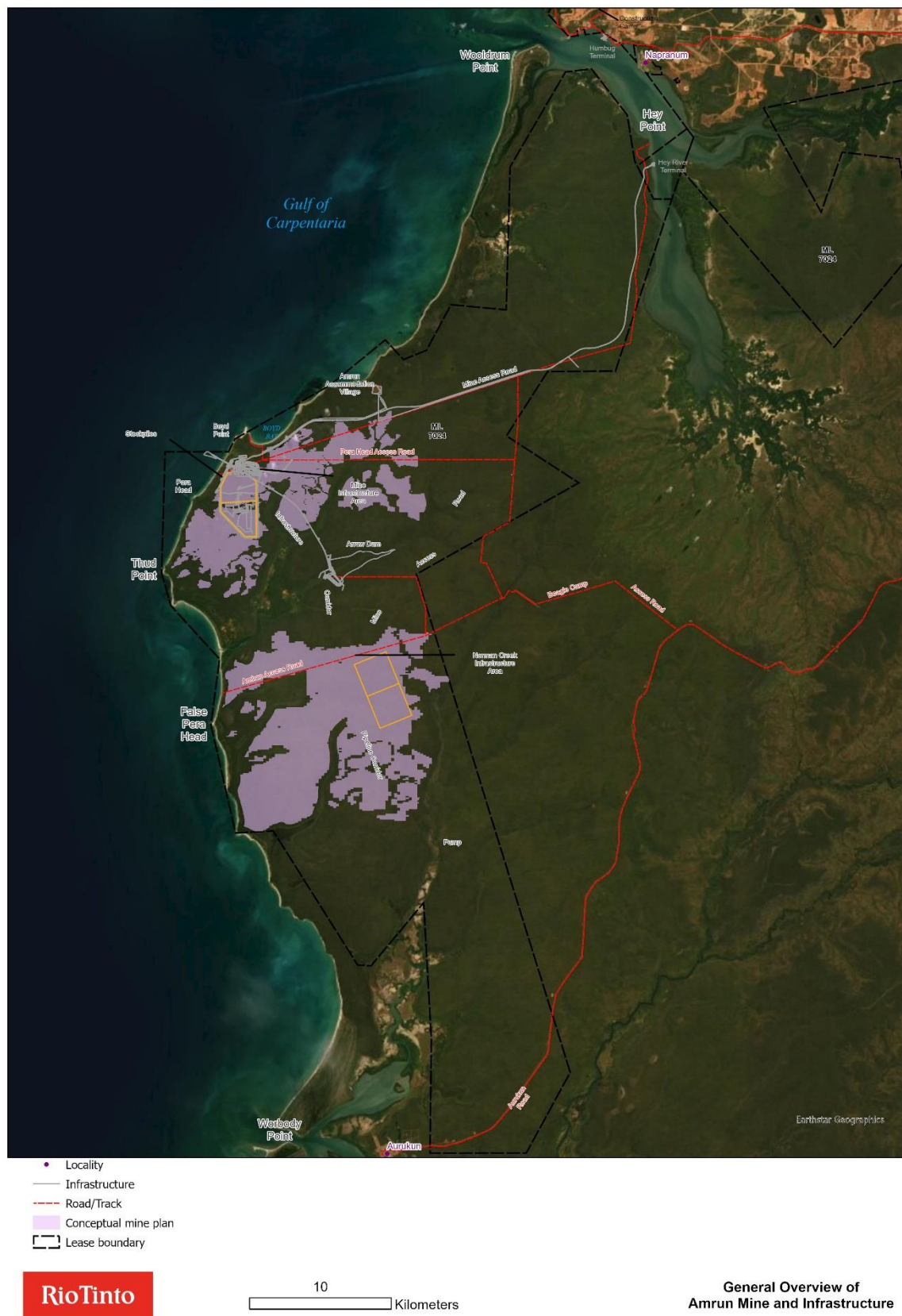


Figure 1: Components of the Amrun Project

## **2. Water Quality Monitoring**

The 2020 and 2021 maintenance dredge campaigns were scheduled to occur over a 4-day period between 11 May – 31 May 2020 and 05 May to 31 May 2021, respectively. For both dredge campaigns, pre-dredge bathymetric surveys identified that dredging was not required, and s bed levelling could readily manage the berth pockets and as such the need for water quality monitoring wasn't triggered on these occasions.

## **3. Pre-Disturbance Monitoring**

The requirements for the Pre-disturbance Program are specified by Condition 22 to 24 of the South of Embley Bauxite Mine and Port Development approval (EPBC2010/5642), issued under the *Environmental Protection and Biodiversity Conservation Act 1999*. The Pre-disturbance Program is presented in Section 5.3 of the Terrestrial Management Plan – South of Embley Project. The Pre-disturbance Program has been implemented in accordance with approval conditions and the Terrestrial Management Plan.

### **3.1 Methods**

#### **3.1.1 Pre-disturbance program**

Condition 22 of the EPBC 2010/5642 approval sets out a Pre-Disturbance Program to be implemented prior to the clearing of any vegetation. Pre-disturbance surveys will be conducted to:

- Determine the presence of any active or potentially active Red Goshawk and/or Masked Owl nests prior to clearing any vegetation. Surveying will be undertaken:
  - Red Goshawk – in areas located within one (1) kilometre of permanent water supporting riparian gallery forest or Paperback wetland; seasonally inundated coastal wetlands and seasonal water courses supporting riparian gallery forest, or an estuary; and,
  - Masked Owl – in areas within 200 metres of permanent water supporting riparian gallery forest of paperbark wetland, seasonally inundated Paperbark wetlands, seasonal watercourses supporting riparian gallery forest or an estuary.
- Surveys will involve walkthroughs of those areas to be cleared, prior to clearing;
- Any observations of nests that may be used by Red Goshawks and/or Masked Owls will be recorded and further assessment undertaken to determine whether the nest is being actively used;
- If an active nest is identified, avoidance, mitigation or management measures will be implemented and a 200m buffer will be established around the nest trees. The nest tree and buffer zone will not be cleared or disturbed until the end of the breeding season (being until fledglings no longer use the nest). Nesting periods are as follows:
  - Red Goshawk - courtship starts as early as April and young do not leave their natal territories until as late as the end of December. Breeding occurs generally in the spring with eggs laid between May and October;
  - Masked Owl - probably breeds between March and October but may breed when conditions are favourable, which can be any time of the year. It is thought that the female occupies the nest for up to 10 weeks before laying. The incubation period is generally 33–35 days but could be as much as 42 days. The fledging period is 10–12 weeks.

- If a potential Red Goshawk and/or Masked Owl nest is located but is not actively being utilised, the tree may be felled immediately to encourage any future nesting pairs to establish a nest outside of the disturbance area.

In addition to the Pre-Disturbance Program under Condition 22, pre-disturbance surveys for Eastern Osprey, White-bellied Sea-eagle and Rainbow Bee-eater will be undertaken within potential nesting riparian forest habitat within Arraw Dam (previously named Dam C) and at infrastructure crossings of riparian forest. Any active nests identified will be buffered until the end of the breeding season for the species in question (see Tables 17 and 18). The protocol for surveys conducted under the Pre-Disturbance Program shall be prepared by an experienced environmental professional with knowledge of the identification of the Red Goshawk, Masked Owl, Eastern Osprey, White-bellied Sea-eagle and Rainbow Bee-eater and their nests.

## **3.2 Target fauna survey methods**

The survey methodology implemented during the reporting period for each of the target fauna species are presented in Table 1 below. The survey methods were implemented within areas to be cleared, prior to clearing. The following parameters are to be recorded for each observation where relevant and possible, however in many instances some of this data (e.g. age class, habitat type) are indeterminable or not applicable for bird observations:

- Species name (common and scientific).
- Time and day of survey.
- GPS location.
- Number of individuals located.
- Age class (if known).
- Habitat type.
- EPBC Act listing status.

Table 1: Pre-disturbance Program target fauna species survey methods

Species	Red Goshawk ( <i>Erythrorhynchus radiatus</i> ) Eastern Osprey ( <i>Pandion cristatus</i> ) White-Bellied Sea-eagle ( <i>Haliaeetus leucogaster</i> )	Masked Owl ( <i>Tyto novaehollandiae kimberli</i> )	Rainbow Bee-Eater ( <i>Merops ornatus</i> )
Method	<p>Systematic traverses, no more than 100m apart, to detect nests within 1km of permanent water supporting the following:</p> <ul style="list-style-type: none"> <li>• riparian gallery forest or paperbark wetland;</li> <li>• seasonally inundated coastal wetlands;</li> <li>• seasonal watercourses supporting riparian gallery forest; or</li> <li>• estuary.</li> </ul> <p>15-minute bird observation points (preferably in the morning or if not then late afternoon) at a density of 1 per 25ha within waterway habitats and the adjacent 200m of 1 per 25ha with focus on detecting active or calling individuals</p> <p>Undertake targeted follow up observations at identified potential nests if needed to confirm ownership or occurrence of breeding activity.</p>	<p>Systematic traverses, no more than 100m apart, to detect nests within 1km of permanent water supporting the following:</p> <ul style="list-style-type: none"> <li>• riparian gallery forest or paperbark wetland;</li> <li>• seasonally inundated coastal wetlands;</li> <li>• seasonal watercourses supporting riparian gallery forest; or</li> <li>• estuary.</li> </ul> <p>Call playback surveys at a density of 1 per 25ha within waterway habitats and the adjacent 200m of 1 per 25ha with focus on detecting active or calling individuals</p> <p>Undertake targeted follow up observations at identified potential nests if needed to confirm ownership or occurrence of breeding activity</p>	<p>Conduct meandering traverses along creek banks and any other vertical earthen cuttings or banks.</p> <p>During traverses visually scan for small holes in banks and for groups of Rainbow Bee-eater individuals.</p> <p>Undertake targeted follow up observations at identified potential nesting holes if needed to confirm occurrence of breeding activity.</p> <p>Incidental observations</p>



### 3.3

#### Results

Surveys were conducted across approximately 690 ha during the Amrun clearing plan for mining and 3814 ha during Amrun Geotech drilling exploration activities during the reporting period which includes all the vegetation specified within the survey methodology Table 1. The results of all surveys were communicated to the Superintendent Land & Rehabilitation.

All observations of target fauna species recorded during the Pre-disturbance Program surveys are presented below in Table 2. The Rainbow Bee-eater and White-Bellied Sea-eagle were listed migratory species when the Terrestrial Management Plan was first prepared. The White-bellied Sea-eagle was removed from the EPBC Act migratory species list in June 2015. The Rainbow Bee-Eater was removed from the EPBC Act migratory species list in April 2016. Surveys for these species have continued in accordance with the commitments within the Terrestrial Management Plan.

Table 2: Pre-disturbance Program target fauna species observations

Common Name	Full Latin Name	Date	Time	Easting (m)	Northing (m)	Habitat	EPBC Act Status	Active Nest	Buffer Established	Notes / Comments
Rainbow Bee-eater	<i>Merops ornatus</i>	23/06/2020	7:12	5746	8568	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> woodland open forest	Listed Marine	No	NA	(Not Heard during bird survey Nest)
Osprey	<i>Pandion haliaetus</i>	2/06/2020	8:19	5719	8571	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> woodland open forest	Listed Marine/Migratory	No	NA	(Not Seen during bird survey Nest)
Osprey	<i>Pandion haliaetus</i>	7/07/2020	9:57	5661	8563	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> woodland open forest	Listed Marine/Migratory	No	NA	(Not Seen during bird survey Nest)
Red Goshawk	<i>Erythrotriorchis radiatus</i>	17/06/2020	7:54	5771	8572	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> woodland open forest	Listed Vulnerable	No	NA	(No Pair, suspected sighting, unconfirmed incidental)
Red Goshawk	<i>Erythrotriorchis radiatus</i>	22/07/2020	10:17	5680	8561	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> woodland open forest	Listed Vulnerable	No	NA	(No Suspected male sighting, unconfirmed incidental)

#### 4. **Weed management**

During the reporting period the Weed Management Program was implemented by the Amrun Project construction, Amrun operations and environmental teams and Traditional Owners through the Land and Sea Management Program (LSMP). Weed management activities included:

- Washdown and inspection of all vehicles travelling into the Amrun Project area, and verification by Project security through collection of weed hygiene certificates and cleanliness checks before permitting vehicles to access the project site.
- All wash-down facilities are self-contained, zero discharge facilities.
- Ongoing weed survey by LSMP and dedicated weed survey was conducted August 2020 by Rio Tinto Weed quality control specialist within the LSMP team. The results of the surveys are detailed below.
- Routine inspections are conducted in and around construction areas and access roads in the Amrun Project area including identification and reporting of weed occurrences.
- Routine ongoing weed control was completed by suitably qualified personnel throughout the reporting period using both manual and chemical treatments depending on the locations.
- The weed identification and reporting procedure has been implemented for site and part of employee inductions and is updated through e-days. Ongoing weed management training is completed with our weed management specialist throughout the year.

Weed surveys are completed by both foot and vehicles. The method chosen is dependent on vision and extent of weed infestation in an area. In either event, the vehicle is driven slowly (approx. 10km/h) along the access track and team members checking to identify weeds across all access tracks on site and within the mine. When sighted the car is safely stopped and the location is recorded and if available, manual or chemical (herbicide) treatment (pickers or glyphosate) will be applied immediately, or the area will be recorded to be revisited for treatment shortly thereafter. Information is recorded into field sheets and then updated into the weed management database by the LSMP team members. In the event a plant is unknown a specimen will be collected and sent to a competent person for further identification.

The main outcomes of the 2020 survey was as follows:

- Previous isolated Class 2 or 3 weed species have been effectively controlled and were not present during the survey indicating the team is on track for successful eradication of the species.
- Isolated occurrences of Gamba grass (*Andropogon gayanus*) were identified as individual plants. These plants were immediately treated, and the area is signed, barricaded and regularly checked and rechecked for additional growth. Most of these specimens have been found roadside along the LV access tracks which indicates these are being transported on LVs and further LV controls are being implemented.
- Overall distribution and abundance of weeds across the mining lease is reduced by proactive weed control implemented by the LSMP Team.
- The LSMP Team members are exceptionally knowledgeable about the distribution of weeds on site.
- The use of targeted herbicides in 2020 for weed spraying has been helpful to kill isolated plants without killing the native grasses alongside.

- Isolated occurrence of gamba were recorded in 2020, however there was no broadscale infestations despite increased traffic indicating weed management practices including enforcement of prevention (washdown) and ongoing survey and control are working.
- Four unintended weed species have appeared in open areas that formed part of a broader authorised seed mix sown for batter stabilisation and erosion control. These species are Rhode's grass (*Chloris gayana*), Indian bluegrass (*Bothriochloa pertusa*), Guinea grass (*Megathyrsus maximus*) and American joint-vetch (*Aeschynomene americana*). While unlikely to result in broader impact, these species will continue to be targeted for eradication by the LSMP team as part of the routine weed control program.

## 5. Fire Management

The fire management program for Amrun (and the greater lease area) aims to reduce the incidence of damaging late dry season fires through 'low intensity' controlled burns. The control program aims to create a mosaic across the site to protect sensitive vegetation types and reduce fuel load. Burns are commenced in late May to early June (early dry season) based on the vegetation condition.

The Amrun fire program has been underway since 2017 supporting construction of the Amrun mining infrastructure. This program is currently adapting to operations and to support progressive rehabilitation commencing in 2021 with the plan currently in development. The site-based plan is reviewed and amended at the end of each fire season to ensure to adaptively manage fuel load ensuring a comprehensive program is implemented for the following season.

In 2018 The Rio Tinto Weipa Operation Management Plan was updated to include the Amrun Fire Management Program to ensure an integrated series of programs is implemented annually, thus enabling the achievement of the key objectives and targets throughout Cape York. The burn program has been designed in consultation with fire management experts, Traditional Owners and from previous site experience. The site-specific plan for 2020 aimed to do the following;

- Build on and compliment the 2019 fire program to achieve a fine mosaic of burnt / unburnt country throughout the lease area inclusive of the offset area.
- Stop the east-west movement of late season wildfires through the lease area which has been occurring on an almost annual basis.
- Build the capacity of the LSMP to implement an on-going fire management program.
- Implement targeted aerial incendiary works across the site.
- The plan aimed to achieve this by completing:
- Aerial incendiary campaigns.
- Ground based ignition using a combination of single point ignition (match) and drip torch burns commencing in May.

Due to movement restrictions associated with the coronavirus pandemic and an extended wet season, only one incendiary program was completed during late July 2020. Ignition points were

attempted over the area; however, the burn was not successful. Vegetation in the area was still very 'green' and the burn program and late season burns in 2019<sup>2</sup> considerably reduced fuel loads.

Figure 2 displays the fire scar mapping obtained from 2017 to 2020 downloaded from the Northern Australian Fire Information (NAFI) website. The mapping displays a comparison between years to identify how the regime has changed since implementation of the burn program across the Amrun site. Consistent with the fire management program objectives, a mosaic pattern is starting to present through the landscape with the ongoing ignitions programs. This program was continued in 2021 and will be reported in the 2021 annual monitoring report.

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<sup>2</sup> In 2019 two large wild fires travelling from the Aurukun road extended through the lease late in the year. Learning from these were implemented in the 2021 program to minimize future occurrence.

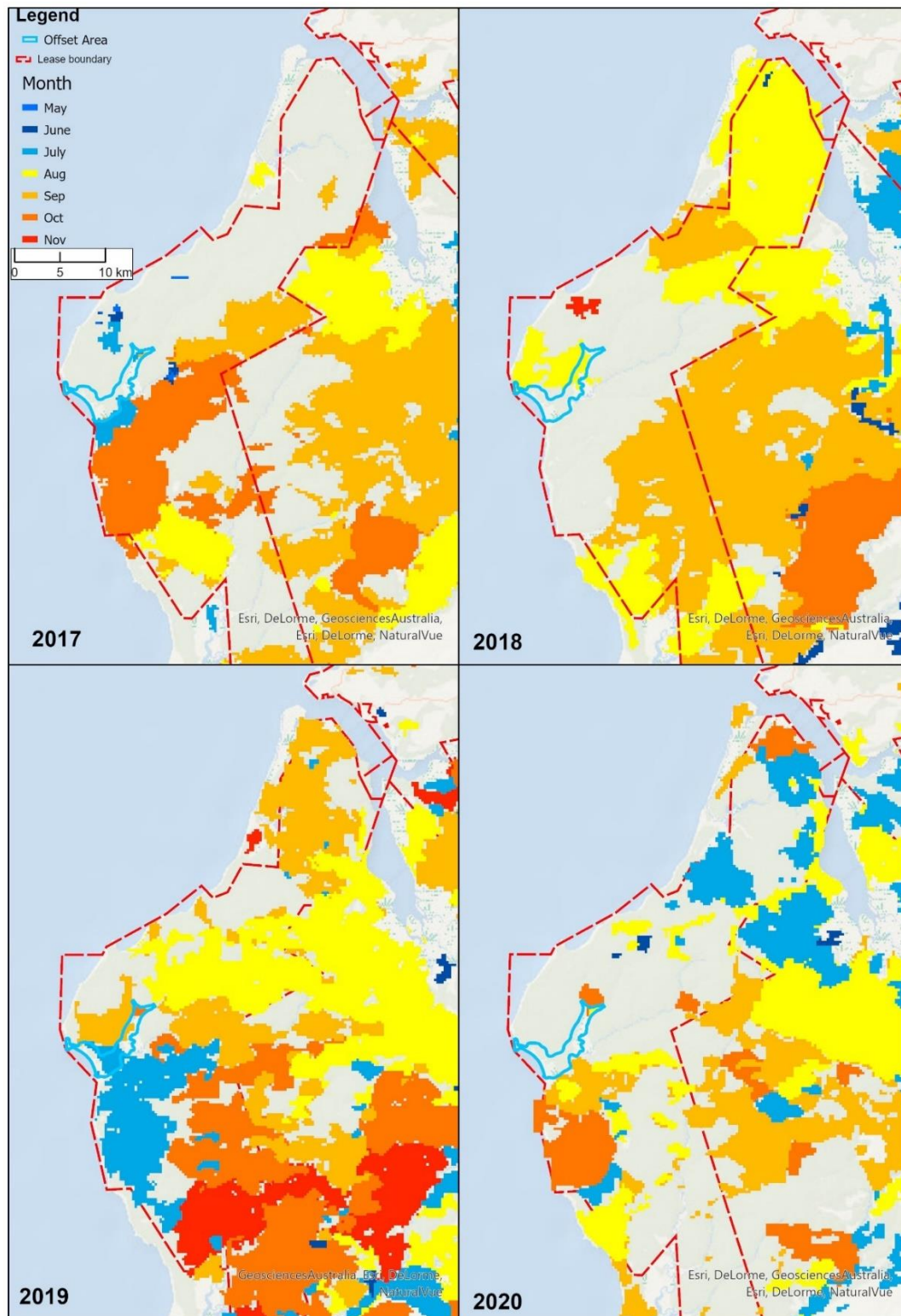


Figure 2: 2017 – 2020 fire scar comparison of the Amrun site using NAFL mapping data

The fire management program is currently operating in accordance with the objective of the Fire Management Plan with reduced to no large-scale late season fires travelling through the area. The information from the monitoring program (satellite imagery) was used to inform the 2021 program.

## **6. Feral Animal Management**

### **6.1 Feral Pigs**

Feral pig eradication is completed via aerial and ground based shooting and pig baiting. Since its inception in 2016, the program has adaptively changed over time to optimise the approach to eradicating feral pigs. This is meeting the intended objective of decreasing marine turtle nest predation along the Amrun foreshore as the key threatening process of these protected species.

The initial scope of the program was to focus on boars (male feral pigs) resident along the coastal swamps and beaches. New data from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) demonstrated feral pigs will move much greater distances to forage, especially on protein-rich food sources including turtle eggs. The program has ultimately been expanded to include most Amrun on-lease areas of ML7024 between the Embley and Ward rivers. The only areas excluded from the program are those in which infrastructure is present. This expanded culling area still focuses on the high-biodiversity coastal swamps of the Ward River, Norman Creek and Winda Winda Creek and Triluck Creek whilst not excluding moving groups of feral pigs outside of these areas.

As part of adaptive management, the feral pig management completed in 2020 exceeded compliance requirements outlined in the Feral Pig Offset Strategy. Learnings from the previous campaigns were reviewed and the program was improved. The amended program was extended to include:

- Combined baiting and ground based shooting program which commenced in July and continued through to December. Bait stations were set at locations along adjacent to the beach<sup>3</sup> and the footage obtained was used to understand movements.
- Mobile shooting team patrol beaches on foot and in All Terrain Vehicles (ATV) to maximise the chances of finding pigs using thermal monitoring methods to optimise interaction.
- One aerial shooting campaign in early August 2020<sup>4</sup>.
- 33 nights of scheduled ground-based shooting instead of 4. This was spread out between July to December to continue to eliminate any pigs which were sighted within the beach control zones.
- Nuisance feral dogs around infrastructure.
- Feral cats whenever sighted.

The 2020 feral pig campaign was successful with 466 feral pigs culled during the program. A summary of the program results and activities are provided in Table 3 and Figure 3. The program is considered successful with the number of pigs per aerial campaign continuing to increase (Table 4).

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<sup>3</sup> Bait stations were moved off the beach in 2020 to discourage beach activity. No pig bait stations were visited by any pigs in 2020.

<sup>4</sup> Two aerial shooting campaigns were originally scheduled; however, the coronavirus pandemic reduced the scope completed to minimize unessential movements to Weipa.

This increase is due to an expanded area along with progressive learning and adaptive management throughout the program's implementation period. No estimate on pig population has been attempted as this is exceptionally difficult to do with accuracy and changes in the control program do not allow comparisons between years. The effectiveness of the control program is monitored through the turtle predation rates by pigs which is the key threatening process and key objective of the Feral Pig Offset Strategy

Table 3: Summary of aerial and ground based shooting results for pigs for 2020

<b>Event</b>	<b>Dates</b>	<b>Animals culled</b>
Ground Shooting Campaign	28 – 27 July	3 pigs all mature boars
Ground Shooting Campaign	3 – 4 August	1 pig
Aerial Shoot	6 - 8 August	429 pigs
Ground Shooting Campaign	12 - 15 August	14 pigs
Ground Shooting Campaign	29 August – 6 September	11 pigs
Ground Shooting Campaign	23 - 26 September	2 pigs
Ground Shooting Campaign	30 September – 2 October	6 pigs
Ground Shooting Campaign	21 November – 2 December	2 pigs
<b>Total</b>		<b>Aerial - 429 pigs</b> <b>Ground – 37 pigs</b>

Table 4: Comparison of feral pig annual cull totals since 2016.

<b>Year</b>	<b>Total Aerial</b>	<b>Pig baiting and ground based shooting</b>
2016	121	1
2017	268	6
2018	300	11
2019 <sup>5</sup>	824	31
2020	429	37
Total	1942	86

<sup>5</sup> The 2020 program included 2 aerial culling campaigns for a total of six days.



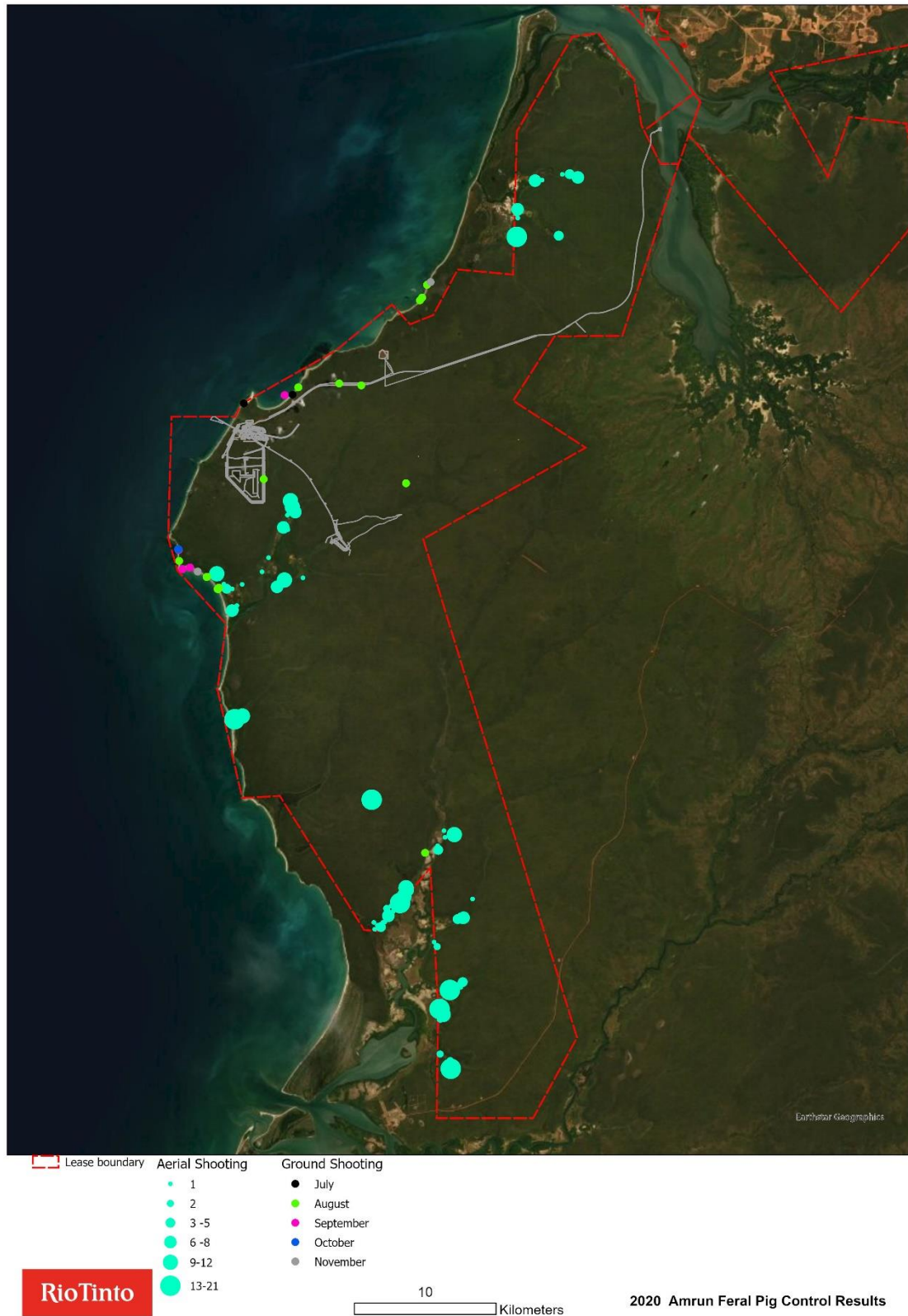


Figure 3: Feral pig engagement locations and timing during 2020 control activities

Toxic baiting was not needed to be utilised as the shooters were able to eliminate problem pigs. The benefit of combining baiting and ground shooting is as follows:

- Takes over 4 weeks to get the animal eating at the station, if it eats at all.
- Animal often avoids the PIGGOUT baits.
- The animal often ingests insufficient amounts and survives the attempt. Incidental observations of the aftermath identified the animals then avoid the baits.
- Quick death for the animal and confirmed kill at location.

As per request of Traditional Owner's, pig carcasses are then burnt during ground-based operations to prevent decay.

## **6.2 Feral Cat and Dogs**

Feral cat and dogs are required to be managed around the camp and mine infrastructure area, as the increase in scavenger opportunities may lead to an increased number of feral cats and dogs. This requires quarterly visual monitoring (spotlighting) and implementation of trapping program if feral animals are observed. These activities are conducted in a manner that is consistent with established animal welfare practices.

As part of adaptive management, the feral cat and dog program continued with the expanded program established in 2019 to provide positive environmental outcomes in line with the intent of the Terrestrial Management Plan. The feral animal requires the following:

- Quarterly visual monitoring through spotlighting at the Mine Infrastructure Area, Camp and Hey River Terminal. Spotlighting commences approximately 30 minutes after sunset. The boundary of each site is monitored by either walking or driving at a maximum speed of 10km/h. The observer holds the spotlight at eye level searching into the vegetation surrounding the site.
- Attempted trapping or baiting of the animals sighted during spotlighting. The animals are naturally cautious and accordingly trapping is completed in a progressive manner to habituate the animals with the traps. Trapping is ongoing until one of the following is met:
  - The animal is captured or known to be deceased;
  - There is no sighting of the target species for 15 days (trapping event is considered three consecutive nights); or
  - Potential impact to animal welfare (e.g. lactating mother, severe weather).

Since implementation of the program the following findings have been noted:

- More animals are sighted and recorded through incidental sightings by the LSMP team than at targeted spotlighting. Repeated visuals of an animal during daylight provides the best chance of trapping animals.
- The ground-based shooters are having the highest engagement with feral cats and dogs. The thermal equipment utilised provides the highest chance of sighting feral animals.
- Cat trapping is ineffective, no animal has returned to investigate the trap or bait.

- Crows are impacting the dog trapping having learnt to obtain the food without setting off the trap.
- No animals have been sighted at Hey River Terminal (HRT) since completion of construction.

The following adaptive management trialled in 2019 were proven to be effective and were continued in 2020, this includes:

- Trapping or ground based shooting is implemented for repeated incidental sightings outside of spotlighting events.
- Introduction of feral cats and nuisance feral dogs around infrastructure as targets for the ground-based shooting program. This provides the following benefits
  - Increased spotlighting and thermal monitoring events to maximise chance of identifying feral animals. This resulted in an additional 37 nights of effort in 2020.
  - Ability to quickly eliminate feral cats in which no progress was made in previous years (0 captures). Nine cats were eliminated in 2020.
- Use of ground-based shooting where possible to eliminate animals sighted during spotlighting surveys.

The program in 2020 was considered successful with 90% of sighted cats and nuisance dogs destroyed. A summary of the feral animal management activities are summarised in Table 5 and **Error! Reference source not found.**

Table 5: Summary of feral cat and dog management activities

Rio Tinto					
Effort	Month	Detection method	Animals	Engagement Location	Comment
Planned	March 2020	Quarterly spotlighting	1 feral cat 1 feral dog	MIA	Trap set
Planned	March 2020	Trapping	Feral cat Feral dog	MIA	No animals captured
Planned	May 2020	Spotlighting	1 feral dog	Camp	
Planned	May – June 2020	Trapping	0 animals trapped	Camp	No animals captured
Additional	28 – 27 July	Ground Shooting Campaign	No animals sighted		
Additional	3 – 4 August	Ground Shooting Campaign	Feral cat Feral dog	Arraw dam Area Camp	Heavily pregnant female
Additional	6 - 8 August	Aerial Shoot	2 dogs		
Planned	12 - 15 August	Ground Shooting Campaign	3 dogs 2 cats		
Additional	29 August – 6 September	Ground Shooting Campaign	Feral cat		
Additional	23 - 26 September	Ground Shooting Campaign	Feral cat	Pera- Thud	
Additional	30 September – 2 October	Ground Shooting Campaign	No animals sighted		
Planned	21 November – 2 December	Ground Shooting Campaign	3 Dogs 3 cats	Camp Boyd Bay, Pera-Thud	
Total					9 cats, 10 dogs



Figure 4: Feral cat and dog engagement locations during 2020 control activities

## 7. Marine Turtle Monitoring

As part of the Amrun project (formerly South of Embley Project) approvals Commonwealth (EPBC 2010/5642 Condition 45) and Queensland (EPML00725113, Condition 42) an annual turtle monitoring program is required. The Queensland Environmental Impact Statement (EIS; RTA 2011)), Queensland Supplementary Report (SEIS RTA 2012) and Commonwealth Environmental impact Statement (2013) identified that lighting at the then proposed Amrun Port could potentially have an adverse impact on marine turtle hatchlings (RTA 2011 and RTA 2012).

While the design of lighting has been developed to minimise adverse impacts on turtle hatchlings, a compensatory measure was proposed in the EIS to enhance overall hatchling survivorship by reducing the predation of turtle nests by feral pigs (RTA 2013). The monitoring associated with this project aims to monitor the progress of the feral pig control strategy to enable adaptive management and maximise hatchling success.

Marine turtle nesting habitat in proximity to the Amrun project was assessed, including all accessible nesting beaches on the Amrun Project mining lease north (approximately 27 km of nesting beach) and south (approximately 32 km of nesting beach) of the Port.

Marine turtle monitoring has been completed along the Amrun project beaches since February and October 2013 (Guinea, 2014), September 2016, September 2017, September 2018 and September 2019 (Pendoley Environmental, 2017) and August 2017 (Pendoley 2017) within the August/September which is the peak nesting period for the region as identified in the 2013 surveys.

Four nesting turtle species have been identified to date including flatback (*Natator depressus*), hawksbill (*Eretmochelys imbricate*), olive ridley (*Lepidochelys olivacea*) and green (*Chelonia mydas*) turtles. Surveys to date have confirmed low density turtle nesting occurs on the beaches between Winda Winda Creek and Ina Creek (RTA 2013, Guinea 2014, Pendoley Environmental 2017;2018;2019;2020 and unpublished data).

As with the feral pig control program, since the program's inception in 2016 the program has adaptively changed over time to optimise the approach to monitoring and understanding the impact of feral pigs throughout the duration of nesting season. The FPOS required turtle surveys to be completed over a two -week period which provided snapshot results. Incidental on-ground results observed nests were being eliminated by pigs and after these surveys were complete and potentially confusing the results. To maximise the effectiveness of the feral pig control program, the program has been augmented internally with monitoring ongoing throughout the year.

In 2019 the program included detailed training for team members and ongoing survey after the completion of activities. In 2020 the LSMP team members were integrated into the operation as full time Rio Tinto employees. This has effectively secured the sustainable longevity of the program with monitoring that would otherwise be outsourced brought 'in-house' and completed by the LSMP Team. The works are completed under appropriate permits from the DES, Permits and Licensing Management and Animal Ethics Committee.

The 2020 program followed the survey methods implemented since 2012 to ensure consistency with baseline surveys (Guinea 2014) and project surveys (Pendoley 2016, 2017, 2018, 2019).



## 7.1 Methods

To remain consistent with previous surveys the area was divided into seven discrete survey beach sections and included all accessible nesting beaches between Winda Winda Creek in the north and Ina Creek to the south. The survey area is shown in Figure 5.

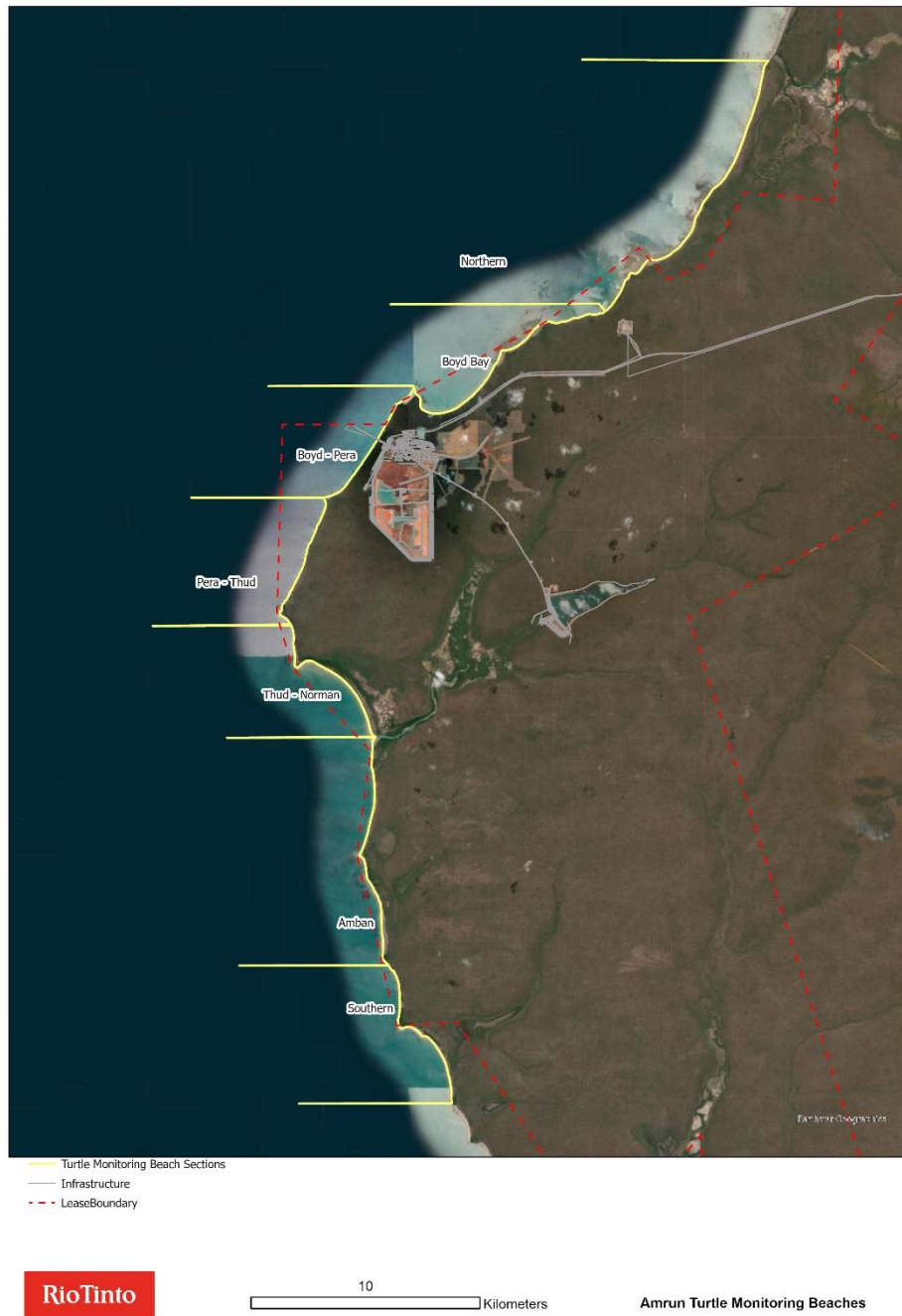


Figure 5: Amrun Turtle Nest Monitoring Beaches

The surveys were completed in 2020 by the LSMP Team which is comprised of Wik-Waya Traditional Owners. The team members have undergone ongoing training since 2016 which included a

verification of competencies. The team continue to undergo regular training each season for ongoing improvement.

#### **7.1.1 Schedule**

In 2020 the Covid-19 pandemic had ongoing impacts associated with access and safety restrictions for the team. The sites from Northern to Norman Creek were regularly accessed throughout the year with incidental observation at least every two weeks. Any occurrences of predation or hatchlings were recorded throughout the year to confirm successful nest or predation. Throughout October to mid-December at least weekly surveys were completed to understand the success of the season's efforts.

Due to the irregularity of access from Covid restrictions, fire and equipment issues Amban and Southern were excluded from the survey in 2020 but will be monitored in 2021, provided no additional restriction are implemented.

#### **7.1.2 Nest census surveys**

Nest identified – census surveys completed using an All-terrain vehicle (ATV) or on foot to identify nests. Data is collected about the nest and associated crawl. Data includes including GPS point, likely species, track widths, hatched nests and any signs of predation. Predated nests are reviewed for the type of predator and whether the nest appeared to be partially or completely impacted.

#### **7.1.3 Predation monitoring**

Where available an infrared motion detection trail camera is placed on a pole adjacent to the nest with signage (species, estimate hatch date etc). The camera is removed when the nest is predated, or the nest has successfully hatched.

#### **7.1.4 Ongoing nest monitoring**

Ongoing nest assessment is completed throughout the survey period. At the end of the season each recorded nest is assigned based on the last recorded nest interaction and includes:

- Predated – where the nest has confirmed sign of predation and (species of predation is identified where possible).
- Partial predation – when an attempt at predation has been made and some eggs may be sighted. The nest is reburied and monitored for the season. It is considered a partial predation event if hatchlings are successfully recorded.
- Hatchlings – this is only assigned when confirmed hatchling tracks or a nest excavation has occurred, and the nest has been successful.
- Potential nest – when a potential nest has been identified this is recorded as a potential nest, unless there are confirmed sighting of eggs (e.g. actively recorded laying).
- False crawl – when a track was recorded but no nest signs associated with a nest e.g. mound or covering were recorded.
- Nest washout – when a natural event such as waves or storms wash out the nest. This is recorded but no results are reported. This normally occurs towards the beginning or end of the year.



### 7.1.5 Nest excavation

Where possible, nest excavation generally occurs 2-3 days after nest emergence. Excavation is completed to confirm species if possible and understand the success of the emergence based on hatched and unhatched eggs.

## 7.2 Results

Results of the feral pig control program were considered successful in 2020 with only six predated nests recorded along the Northern – Norman Creek beach sections (Figure 6). This represents approximately 3% of potential turtle nests or approximately 6% of confirmed nests. This is well above the target of a 70% reduction in nest predation across each beach section, in short, a resounding success.

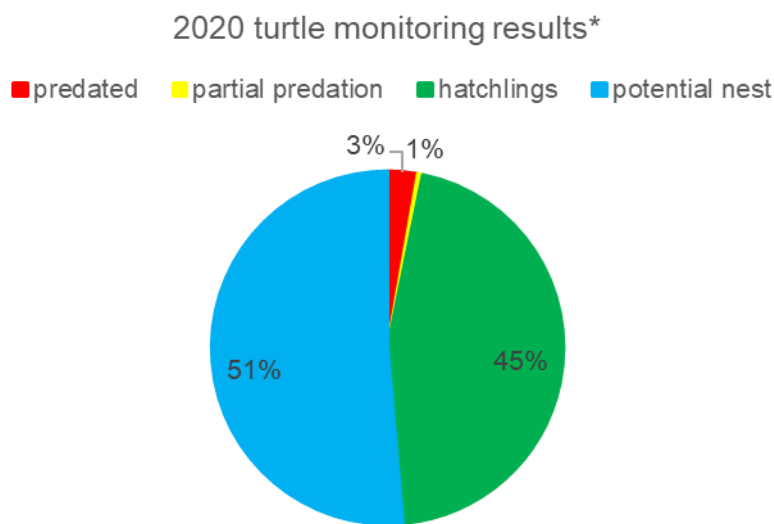


Figure 6: 2020 turtle monitoring results<sup>6</sup>

In total 225 monitoring events recorded with turtles with Hawksbill and Flatback turtles the dominant interactions (Table 6, Figure 7). Previous years have had a higher proportion of flatbacks, however this may be due to the time of year monitoring has occurred. Further monitoring throughout the year and along all nesting beaches will provide further clarity.

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<sup>6</sup> Results are restricted to the Northern to Norman Creek beach sections which were regularly accessed

Table 6: Summary of nesting results per species

<b>Species</b>	<b>Predated</b>	<b>Partial predation</b>	<b>Hatchlings</b>	<b>Potential nest</b>	<b>Total</b>
Flatback	1	1	29	24	55
Green	1	Nil	19	10	30
Haw ksbill	Nil	Nil	28	35	63
Olive-ridley	Nil	Nil	16	26	42
Unknown	4	Nil	7	17	28

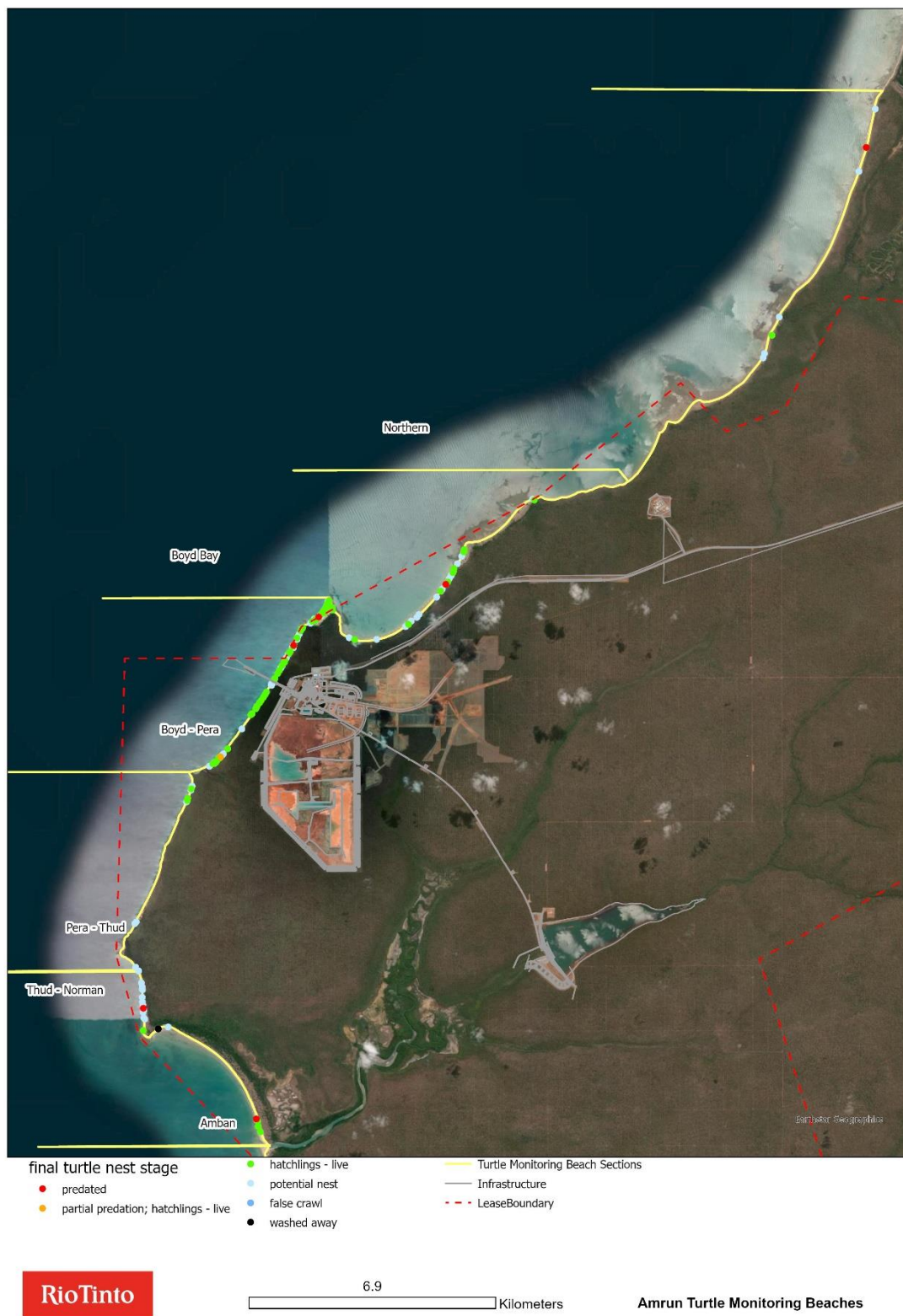


Figure 7: 2020 turtle monitoring results for Northern to Norman Creek

## 8. Marine Pest Monitoring

The Amrun Project (formerly South of Embley Project) involves the construction and operation of a new Port facility (Port of Amrun) located between Boyd Point and Pera Head. The marine works include construction of a jetty, wharf and ship loaders. Construction of the marine aspects of the Port commenced in May 2017.

It has been identified that vessels that may have visited ports of concern<sup>7</sup> have the potential to translocate marine pests. Should a marine pest be introduced to local marine waters, an increase in artificial structure at the Port has the potential to provide suitable habitat for marine pests to become established.

Marine pests are marine biota that are translocated into waters outside their natural geographic range and subsequently settle, survive and spread. Translocation and survival of these species in new areas can cause irreversible impacts to the local ecosystem by competing with and/or preying on native species, as well as introducing disease. The consequences can include a combination of environmental, social and economic impacts.

The marine pest settlement plate monitoring program has been amended to utilise the Queensland's Seaports eDNA Surveillance (Q-SEAS) Program and will be installed to meet some of these requirements. This approach in no way compromises the effectiveness of the marine pest surveillance program as the previous arrangement was established to service the construction phase of the program prior to structure being available. Now the export facility is established it provides an appropriate alternative as a platform to conduct marine pest surveillance monitoring. The appropriateness of which has been consulted on with Biosecurity Queensland who concur.

The ongoing Covid pandemic restricted the ability to implement the settlement plate monitoring in 2020 and 2021. Impacts included:

- Equipment parts unavailable due to global slow down
- Issues with access to vessels with biosecurity restrictions associated with remote communities
- Operations near international ship terminal restricting movements and ability
- Dynamic nature of pandemic introducing late changes to the works.

Throughout the installation process, several safety issues have been identified and the intended locations have needed to be amended for:

- Ship safety
- Personnel safety (Snap back zones)
- Regular ongoing access

This process is being worked through for maximum benefit along with extending the program.

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<sup>7</sup> Those ports that are recognised as harbouring invasive marine species with risk of translocation to other port are as.

Visual surveys for Asian green mussel (*Perna viridis*; AGM) were made along beach shores and accessible intertidal rocky reef areas. Suspected shells were collected and provided to a marine biologist for identification. Areas explored were limited to between Boyd Bay and Pera Head which is near the export facility. Beach wrack surveys are ongoing through the year while completing turtle surveys and no marine pests were identified on the beach throughout the year.

Table 7: Summary of beach surveys days per month to end of 2020 for Boyd to Pera Head

<b>Month</b>	<b>Number of beach inspection per month</b>
March	1
April	2
May	2
June	10
July	5
August	9
September	10
October	6
November	9
December	4